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The Influence of the Magnetic Field on the Deposition Rate and Ionized Flux Fraction in the HiPIMS Discharge JON T. GUDMUNDSSON, HAMIDREZA HAJIHOSEINI , University of Iceland, MARTIN CADA, ZDENEK HUBICCKA , Institute of Physics v. v. i., Academy of Sciences of the Czech Republic, SELEN UNALDI, LPGP, Universit Paris-Sud, MICHAEL A. RAADU, NILS BRENNING, KTH Royal Institute of Technology, DANIEL LUNDIN, LPGP, Universit Paris-Sud — The effect of the magnetic field strength $|\mathbf{B}|$ and geometry (degree of balancing) on the deposition rate and ionized flux fraction F_{flux} in dc magnetron sputtering (dcMS) and high power impulse magnetron sputtering (HiPIMS) when depositing titanium are explored [1]. The magnetic field only influences the dcMS deposition rate slightly. The deposition rate during HiPIMS operated with fixed voltage increases from 30% to 90% of the dcMS deposition rate as $|\mathbf{B}|$ is decreased but F_{flux} decreases. In contrast, when operating the HiPIMS discharge in fixed peak current mode both the deposition rate and F_{flux} increase with decreasing $|\mathbf{B}|$. The measured quantities, the deposition rate and ionized flux fraction, are then related to the ionization probability α_{mt} and the back attraction probability of the sputtered species β_{t}. We show that the fraction of the ions of the sputtered material that escape back attraction increases by 30% when $|\mathbf{B}|$ is reduced during operation in fixed peak current mode while the ionization probability of the sputtered species increases with increased discharge current when operating in fixed voltage mode. [1] Hajihoseini et al. *Plasma* **2** (2019) 201

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